NEWSLINE

LOOKING BACK AT 2004

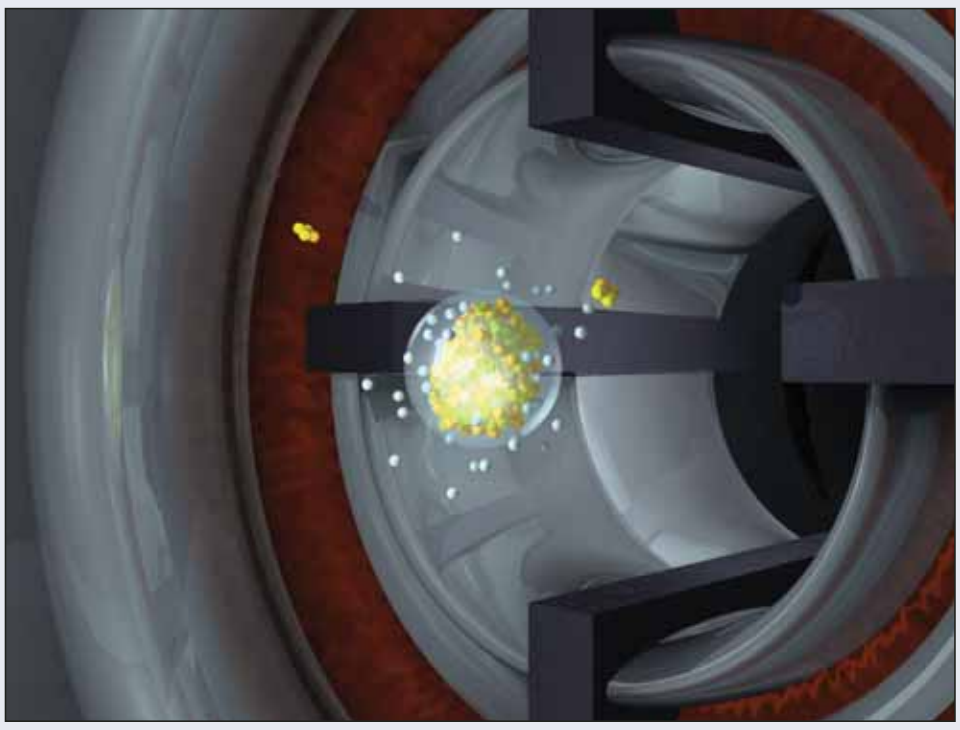
A look back at the significant events covered in *Newsline* during the year 2004.

2004: Turning challenges into opportunities

In an address to employees early last year, Director Michael Anastasio called 2004 a year of "challenges and opportunities" for the Laboratory.

Laboratory programs met the challenges of budgetary and election year uncertainty and made the most of opportunities to advance national security missions, science and technology, and to strengthen operations. The year also brought changes to the Laboratory's senior management team.

The following are select highlights from 2004.



In February, the residue of the collision between a calcium isotope and americium creates the new element 115 that begins alpha decaying into element 113.

Leadership

Glenn Mara, deputy director for Operations; Hal Graboske, deputy director for Science and Technology; Den Fisher, associate director for Safety and Environmental Protection; and C.K. Chou, associate director for Energy and Environment, retired after long Laboratory careers. Phil Schultz, the Lab's longtime chief financial officer, also retired.

Anastasio selected Wayne Shotts, formerly associate director for Nonproliferation, Arms Control and International Security (NAI) and acting head of the Lab's Homeland Security Organization (HSO), to serve as acting deputy director for Operations. Cherry Murray, a vice president with Bell Labs, was named deputy director for Science and Technology after a nationwide search. Jane Long, a renowned hydrogeologist and geotechnical engineer, was named associate director for Energy and Environment.

Bill Bookless, formerly deputy associate director in Defense and Nuclear Technologies and N Program leader, was named associate director for Safety and Environmental Protection. Elbert Branscomb, a veteran Lab leader in bioscience and former director of the Joint Genome Institute in Walnut Creek, was selected as associate director for the Biology and Biotechnology Research Program Directorate. Steve Cochran was tapped by Anastasio to serve as acting associate director for NAI and to head HSO.

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Science and technology, people and operations in 2004

Editor's note: Below is a month-by-month recap of the major events of 2004.

January

Science and technology

• The Lab's annual royalty income from its patents and copyrighted software tops $4 million for the first time. From 1992 through 2003, Lab patents and copyrighted software generated more than $25 million in licensing income — the most in the Department of Energy system.

• The Laboratory shows off its laser peening technology, a process that extends the service lifetime of metal products, during a press conference at Metal Improvement Co. Inc., its commercial partner's branch office in Livermore.

• Lab scientists Jeffrey Nguyen and Neil Holmes determine the melting point of iron, essential to determine the temperatures at core boundaries and the crystal structure of the Earth's solid inner core.

• The Joint Genome Institute debuts the Department of Energy's Community Sequencing Program (CSP) to provide a world-class sequencing resource for all scientific disciplines.

• Scientists Christopher Mundy and I-Feng Kuo reveal details of the reactive states and faster relaxation of molecules at the water-to-air interface, producing important results in atmospheric science.

People

• Van Emden Henson of Computation is named editor of the Lab's *Science & Technology Review* magazine.

• Lab employee Harry Briley is honored by the Alameda County Mental Health Association for his volunteer work as a meeting facilitator.

• Former San Francisco Mayor Willie Brown addresses Laboratory employees during a Martin Luther King Jr. celebration.

• Lab scientists Mike McCoy and Mark Seager of Computation and Ben Santer and Ken Caldeira of Energy and Environment receive the fourth annual Edward Teller Fellowship awards. The award allows the recipients to do a year's worth of self-directed work that benefits the Laboratory.

• Electronics engineer David Chambers is elected a fellow of the Acoustical Society of America for his contributions to time reversal processing methodology.

In January, laser peening induces deep compressive stress, which significantly extends the service lifetime of metals.

• Director Michael Anastasio's administrative assistant Carol Boyd retires after 23 years of service. Kinnon Ernst, who has worked at the Lab since 1978, takes her place.

• Close to 100 attendees of the Photonics West conference tour the National Ignition Facility.

• Lab employee Steve Grey is tapped to serve on the Federal Communications Commission's Intergovernmental Advisory Committee.

Operations

• The University of California Board of Regents preserves the University's option to compete for contracts to manage Lawrence Livermore, Lawrence Berkeley and Los Alamos national laboratories.

• The Edward Teller Education Center opens and a new scholarship in Teller's name is announced for Livermore's top high school science students.

• LLESA kicks off Body Challenges 2004, a 12-week, Labwide employee health and fitness program. Participants earned points by making healthy lifestyle choic-

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es, including exercise, nutrition, stress reduction and health issues.

• The Lab receives the 2003 Federal Energy and Water Management Award and the Department of Energy's 2003 Departmental Energy Management Award for its energy conservation programs.

• The Lab Women's Association (LLLWA) presents 10 scholarship awards to Lab employees pursuing their formal education concurrently with their careers. The association creates a new award, "The Joni Schuld Administrative Excellence Award," in honor of Schuld, to recognize a recipient who displays academic merit, a dedication to the Lab's administrative excellence, high integrity and respect for the entire team.

• The Fifth Street roadway repair and re-route project between West Perimeter Drive and Avenue A and between Avenue B and West Inner Loop is completed.

• Procurement and Materiel develops a new Electronic Ordering System (EOS) under the Laboratory Integrated Network for Contracts and Supply (LINCS) application.

More than 600 elementary school students attended the Lab's Engineers Day in February. Here, students use a remote control to operate a robotic arm.

February

Science and technology

• Scientists from the Lab's Glenn T. Seaborg Institute and the Chemical Biology and Nuclear Science Division, in collaboration with researchers from the Joint Institute for Nuclear Research in Russia (JINR), discover the two newest super heavy elements, element 113 and element 115. The discovery expands the fundamental principles of chemistry and possibilities for new materials and new technologies.

• A ribbon cutting ceremony marks the completion of the Lab's new International Security Research Facility. Larry Gresham, the deputy director of DOE's Office of Intelligence, tells the audience that the new facility will enhance collaboration with the DOE Office of Intelligence and that the Laboratory plays an important part in the intelligence community.

• The Laboratory is awarded the 2004 "Excellence in Technology Transfer" award form the Federal Laboratory Consortium (FLC) for the portable radiation detector called RadScout, which was developed into a commercial product in 2002.

People

• Elbert Branscomb, chief scientist for the Department of Energy's Genome Program and the former director of the Joint Genome Institute in Walnut Creek, is named the new associate director for Biology and Biotechnology Research.

• Gen. John Gordon, assistant to the president and homeland security adviser, visits the Lab and receives an update on the National Ignition Facility (NIF) from Ed Moses, NIF project manager.

• Larry Foulkes, president of the American Nuclear Society and consultant in reactor physics at Bettis Laboratory, presents a seminar on the status and future of nuclear science and technology in the United States, and meets with staff who are engaged in nuclear energy research.

Operations

• The Laboratory's new Central Café opens, offering higher quality food service options and nearly doubling the serving capacity.

• More than 600 local students attend the Lab's Engineers Day, held outside the Bldg. 123 auditorium, and participate in hands-on exhibits and science displays.

• The Laboratory unveils a new compensation program for the 100 series job classifications, providing greater equity and consistency across all directorates.

• The Lab introduces a new e-mail extension blocker that stops infected messages from getting into the Lab. The software defends against an assault by a new internet worm, W32.Beagle.B.

Quotables

"I'm just swept off my feet when I look at it (the Lab) now. When I see what's here now I can't believe my eyes — the level of science is overwhelming, it's just mind-boggling."

– Former Oakland Tribune science reporter Tom Riley, during Community Leader Day

"However, I admit that I still get excited watching C-SPAN."

– Kathy Cromwell, departing LLNL congressional liaison, on the challenges of developing an outside-the-Beltway perspective

"I believe today that simulation science is a peer with theory and experiment."

– Dona Crawford, on simulation capabilities of LLNL's high-performance computers

"The operational burden of inspecting a Safeway truck that is coming across the border full of kitty litter is the same as looking for a nuclear weapon in the back of the truck."

– Mike Carter, on the problem of detecting nuclear and radiological materials

March

Science and technology

• The laser guide star adaptive optics system created by LLNL scientists is used by scientists from UC Berkeley and the Lab in conjunction with astrophysicists from the California Institute of Technology, UC Santa Cruz, the National Science Foundation's Center for Adaptive Optics and UC's Lick Observatory to observe for the fist time that distant larger stars formed in flattened accretion disks just like the sun.

• The Joint Genome Institute (JGI) staff celebrates achieving an unprecedented level of DNA sequence generation — some 2 billion bases in one month — at the Production Genomics Facility (PGF) in Walnut Creek.

• *The Scientist* magazine cites LLNL as one of the nation's best workplaces for postdocs, in a survey ranking the Lab seventh among 61 institutions.

• The 8th Annual Tri-Valley Science and Engineering Fair takes place at the San Ramon Conference Center. The event draws more than 300 science-minded students in grades 7-12 from Livermore, Pleasanton, Dublin, Sunol, San Ramon and Danville.

People

• Tammy Jernigan, former astronaut and assistant associate director for special projects for the Physics and Advanced Technologies Directorate (PAT), is named the 2004 Outstanding Woman of the Year in the science category in the Alameda County Women's Hall of Fame and is honored at an awards ceremony.

• Tom Reed, author and former thermonuclear bomb designer in A Division, returns to his Laboratory roots to discuss his recently published insider's history of the Cold War, "At the Abyss."

• Charles "Chuck" Alexander McDonald Jr., E.O. Lawrence Award recipient and former Laboratory associate director at large, dies at age 75 in his Southern California home, after a 23-year battle with cancer.

• Jesse Yow is named as the division leader of the Environmental Restoration Division (ERD) in the Environmental Protection Department (EPD).

Operations

• The Hazards Control Department unveils a new ergonomic Website containing resources and information aimed to educate employees and increase ergonomic awareness.

April

Science and technology

• A memorandum of understanding establishes a framework for scientific and technical collaborations on national security between the Laboratory and the Naval Postgraduate School in Monterey.

• The Joint Genome Institute and Stanford University complete the sequencing of human chromosome 19, the most gene rich of all the human chromosomes.

• A team of scientists including Livermore atmospheric researchers Cyndi Atherton and

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Dan Bergmann finds a new method for measuring ozone. The technique uses a computer model that can simulate how both ozone and hydrogen chloride in the stratosphere travel downward across the tropopause and into the upper troposphere. Until this breakthrough, no experimental technique could reliably quantify stratospheric ozone in the upper troposphere.

• A three-UC-campus study initiated and directed by geotechnical engineer Francois Heuze reveals discrepancies in seismic hazard estimates because the severity of ground shock could vary widely. UC is re-examining the earthquake hazard assumptions it has been using in light of these findings.

• A new LDRD-funded national security research initiative at the Lab aims at the rapid diagnosis of infection one
to two days after exposure, rather than waiting days or weeks for symptoms to appear. The research team spans seven directorates and several disciplines on this new "pathomics" project.

• The second annual Livermore Live Science Conference at Wente Vineyards attracts more than 100 Bay Area business people interested in the latest trends and business opportunities in biotechnology and medical research.

• DOE's Joint Genome Institute holds a jamboree where participants examine a toxin-eating microbe named *Desulfovibrio desulfuricans G20*.

People

• Lab computer scientist Pat Miller creates a "flashmob" supercomputer by linking 1,000 laptops at a weekend gathering at the University of San Francisco. He achieved a respectable rating of 180 gigaflops (billion floating-point operations per second).

• David Kaczynski, brother of the notorious Unabomber, addresses employees about how he came to realize his brother Ted's criminal identity.

• Director Michael Anastasio forms search committees to find replacements for Laboratory retiring associate directors Dennis Fisher of Safety and Environmental Protection, and C.K. Chou of Energy and Environment.

• Associate Director Den Fisher runs the 26 miles, 385 yards of the Boston Marathon in a time of 4:04:16. This finish puts him 78th among the 600 senior men entrants aged 60-69.

• Plant Engineering Department employees volunteer to spend their weekend finishing the remodeling of a Livermore family's home for an episode of ABC-TV's "Extreme Makeover." The family consisted of eight children, ages 12-23, who were orphaned when both parents died of heart attacks just two weeks apart.

• In an all-hands address, Director Michael Anastasio provides employees with an upbeat presentation on the opportunities and challenges the Laboratory faces. He specifically addresses prospects for stockpile stewardship, NIF, the overarching importance of safety and best-in-class security. Introducing an updated "A-List," he reminds everyone to remain focused on Laboratory missions.

Operations

• A study committee from the National Research Council of the National Academies visits the Laboratory to gather relevant information about the upcoming contract competition for the Lawrence Livermore and Los Alamos national laboratories. The group focuses on the scientific and technical aspects of the competition.

• Based on a Defense Nuclear Facilities Safety Board Recommendation, the Laboratory completes stabilizing and packaging for shipment of its surplus plutonium oxide. DNFSB board members toured the SuperBlock to witness the milestone.

• A professorship announcement links NIF and UCLA plasma physics groups. This is part of a stepped-up effort by UC to tap into the scientific expertise and facilities of the national laboratories managed by the University.

• The summer swim program for employee families ends.

• UC President Robert Dynes issues a policy document concerning Classified Removable Electronic Media to strengthen CREM accountability at the two UC laboratories that conduct classified research.

• The Safeguards and Security Department simplifies its moniker to become the Security Department.

• Earth Expo 2004 spotlights the Lab's conservation efforts, energy technologies as well as regional and local efforts to reduce waste, conserve energy and protect the environment.

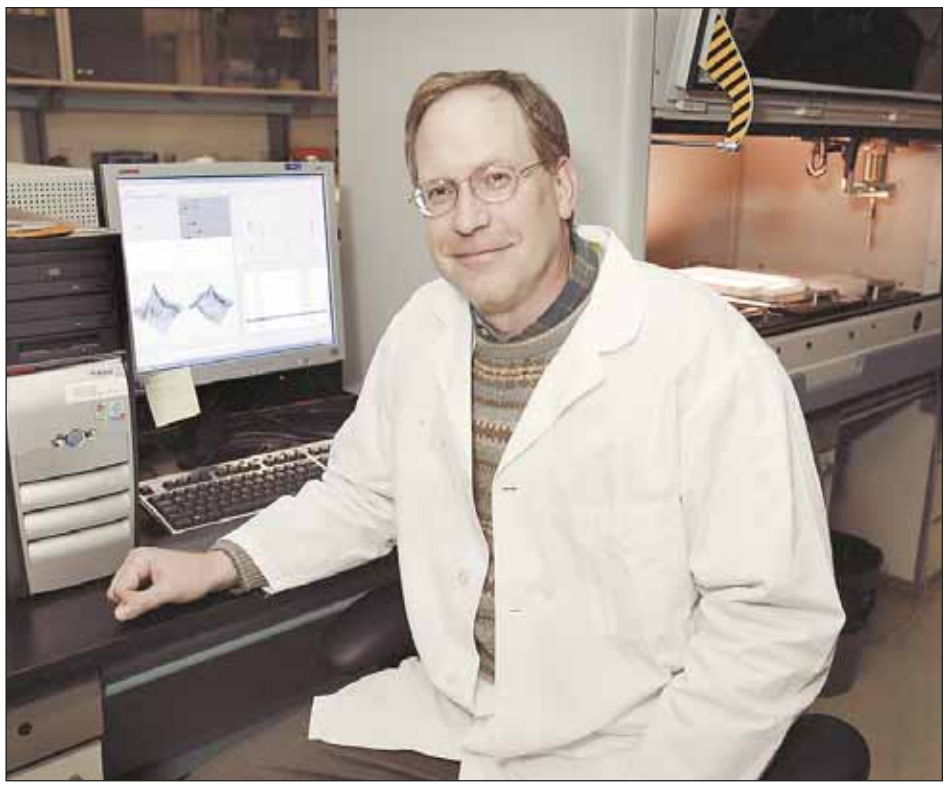
• Sixty-one out of 240 protesters were arrested outside the Lab's Westgate entrance on Good Friday.

• An itinerant mountain lion joins 240 protesters on Good Friday outside the Lab's Westgate entrance. The cougar was dispatched by local law enforcement officers, at the direction of the Department of Fish and Game.

• The public hearings and comments on the Lab's Site-Wide Environmental Impact Statement for Continued Operations takes place in Livermore, Tracy and Washington D.C.

• The Security Department receives high marks for performance from DOE in a special security review. The highest formal rating is assigned to cyber security and Protective Force.

• Along with others in the cyber-community, Laboratory computers are assaulted by a bevy of malicious code attacks and threats, including worms, bugs, Trojan horses and a hoard of "phishing" scams.



In April, Ken Turteltaub, head of Biology's Biodefense Division, is one of the team members on the pathomics project.

May

Science and technology

• A paper on use of the Lab's Autonomous Pathogen Detection System to detect two bioterrorism agents simultaneously is selected by the Chemical Abstracts Service of the American Chemical Society, as the "most intriguing" paper from among 200,000 documents reviewed. The paper was a collaboration between Livermore scientists and Army researchers at the Dugway Proving Grounds.

• The popular "Science on Saturday" travels to Los Baños High School in the Central Valley. Lab physicist Don Correll presents the lecture, "Fusion Energy: What Happens at 100,000,000 degrees?"

People

• Members of the Lab's Armed Forces Veterans Association hold a noontime Memorial Day Ceremony at the Rose Garden with special remembrance of Lab employee and Vietnam War veteran Doug Brown, who died in 2003.

• Deputy Director for Operations Glenn Mara delivers a keynote address at the UC Project Management Symposium in Pleasanton, sponsored by the UC Office of the President.

• Postdoc Richard Snavley of the NIF High Energy Density Experimental Science Program learns he will be honored at the UC Davis commencement ceremony when he receives the Allen G. Marr Distinguished Dissertation Award for "Physics of Laser Driven Relativistic Plasmas, Energetic X-Rays, Proton Beams and Relativistic Electronic Transport in Petawatt Laser Experiments."

• Edmond Chow and Christine Orme are honored with the Presidential Early Career Awards for Scientists and Engineers. DOE's Office of Science nominated both for outstanding work in their early careers.

• Ten Lab firefighters are honored by the National Nuclear Security Administration for

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Quotables

"I hope to serve as a role model to all young girls, helping them to understand that women can earn respect in the fields of science and math."

–Tammy Jernigan, on being inducted into the Alameda County Women's Hall of Fame

"Culminating 18 years of research, this partnership exemplifies DOE's commitment to advancing our understanding of the interplay between our human health and the environment."

– Spencer Abraham, on chromosome 19, the most gene rich of all the human chromosomes

"The holy grail — and greatest hope — of this project is that we could gain enough knowledge of disease and its molecular response in the human body that we would be able to identify the presence of a disease we've never seen and even recommend a treatment for it."

– Fred Milanovich, Chemical and Biological National Security Program

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their heroic actions in fighting two wildfires in Southern California in October 2003: the Grand Prix fire in San Bernadino County and the Cedar fire in San Diego County.

• The Lab's Jose Hernandez is one of 11 men and women selected by NASA to join the 2004 Astronaut Candidate Class.

• The Protective Force Division's SPO team garners third place in the annual DOE complex-wide Security Police Officer Training Competition. The event was held at the Savannah River Complex near Aiken, S.C.

• Vice Adm. Lowell E. Jacoby, director of the Defense Intelligence Agency, visits the Laboratory.

Operations

• The pop-up barriers at opposite ends of the East Avenue security corridor are maintained in the "up" position starting on weekends.

• The UC Regents approve a new voluntary 457(b) savings plan that effectively doubles the amount of money Lab employees may direct into tax-advantage retirement savings.

• Food, dancing and scholarship funds are part of the Cinco de Mayo celebration near the Lab's pool.

• Bldg. 142, the Lab's first "replacement" office building constructed under the Facility and Infrastructure Recapitalization Program, is dedicated.

• The SAFE Program earns the first "excellent" rating ever garnered by a DOE/NNSA counterintelligence office. The rating was the result of an intensive audit by Office of Counterintelligence inspectors between March 22 and April 1.

• UC faculty members issue their strongest endorsement yet of the University's continued role in managing the Livermore and Los Alamos labs. A statewide electronic survey shows that two-thirds of the participating members of the UC Academic Senate said that the University should bid to retain the two lab management contracts.

• The new Administrative and Specialist salary structures and job classification become effective, as employees receive their job-slotting notifications.

In May, Edmond Chow aand Christine Orme earned the 2002 Presidential Early Career Awards for Scientists and Engineers (PECASE) for outstanding work they have achieved and their potential for future leadership.

Quotables

"We have come to a turning point in the history of the effort to understand life, yet it is impressive how little we do understand about it. As rapidly as our knowledge of life is expanding, our knowledge of what we don't know is expanding even more rapidly."

– Elbert Branscomb, Lab associate director for Biology and Biotechnology, who opens the program with an animated discussion of "What It Means to Have a Genome"

"I read the manifesto online searching for a disqualifier. I was troubled that I couldn't find a disqualifier. Some sections sounded a bit like him. I thought maybe there was one chance in a thousand."

- David Kaczynski, brother of Unabomber Ted Kaczynski

"The goal is for us to make the Laboratory as effective as possible for everybody here, as well as for our sponsors on the outside."

– Lab Director Michael Anastasio, introducing an updated "A-List," reminding employees to remain focused on Laboratory missions

June

Science and technology

• The Laboratory's newest supercomputer, named "Thunder" debuts as No. 2 on the prestigious "Top500" list of the world's fastest computers. With a peak speed of 23 teraflops (trillion operations per second), Thunder is designed primarily for scientific research in such areas as materials science, energy and environment, biology, structural mechanics and cosmology.

• Researchers at the Walnut Creek-based Joint Genome Institute complete the DNA sequencing of the pathogenic microorganisms that primarily attack soybeans and also cause Sudden Oak Death.

• Lab employees working for the Department of Energy's Computer Incident Advisory Capability, which combats computer viruses, intruders and Internet hoaxes observe the center's 15-year anniversary.

People

• Six security police officers — Michael Adams, Joshua Chance, Brian Cudmore, Michael Doran, Mark Dufour and Hai Thanh Do McKinney — are promoted to the rank of sergeant.

• Flags at the Laboratory are lowered to half-staff to observe the death of President Ronald Reagan.

• Laboratory engineer Ray Stout is named a fellow of the American Society of Mechanical Engineers (ASME).

Operations

• The Laboratory is honored by Red Cross Northern California Blood Services as the top sponsoring organization for the Northern California region.

• During its second annual Community Leader Day, the Laboratory welcomes about 150 community leaders representing local government, businesses and civic organizations from the Bay Area and the Central Valley.

• The Department of Energy announces it will extend the current University of California contract to manage LLNL beyond its current Sept. 30, 2005 expiration date in order to conduct separate competitions for managing the Laboratory and Los Alamos.

• Copies of the Laboratory's "2003 Annual Report" are distributed to employees.

• Lab Security Department leader Russ Miller implements a reorganization plan to provide better service. One of the key changes is a newly created program support manager, who serves as the primary security liaison to UC, program managers and senior Laboratory management.

• The pool closes June 25 after inspections of the area surrounding the pool identified potentially serious structural integrity and safety concerns.

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A list 2004

LAWRENCE LIVERMORE NATIONAL LABORATORY

- Enable continuing U.S. preeminence in nuclear weapons expertise by meeting our commitments and developing strategies for the future.
- Create technologies and operational capabilities to counter terrorism and proliferation of weapons of mass destruction (WMD).
- Deliver NIF and develop an integrated ignition/high-energy density (HED) experimental plan.
- Implement and evolve the S&T investment plan.
- Maintain effective financial, business and environmental operations.
- Deliver workforce initiatives and develop leaders for the future.
- Develop a strategy to enhance our efficiency, effectiveness and flexibility.
- Build on our leadership in supercomputing and ensure ASCI Purple is delivered on schedule.
- Execute our initiatives for DoD, Office of Science, Energy and Environmental programs.
- Expand cross-organizational partnerships.

Improve security enhance safety as overarching priorities

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July

Science and technology

• Laboratory researchers garner five R&D 100 awards for developing advanced technologies with commercial potential, raising LLNL's number of these awards won since 1978 to 102.

• Thanks to a collaboration between LLNL and Lawrence Berkeley National Laboratory, the Lab's National Atmospheric Release Advisory Center can now track and predict the movement of chemical and biological agents indoors as well as outdoors.

• A team of researchers from the Laboratory, in collaboration with UC Berkeley's Space Science Laboratory and Johns Hopkins Applied Physics Laboratory, announce that they have designed and built a high resolution gamma-ray detector that will enable NASA's Mercury Messenger to measure the elemental composition of the planet's crust.

• New legislation is introduced to create a federal water technology program aimed at expanding and coordinating water technology research around the country to improve water quality and quantity. As proposed, LLNL would partner with others to be a regional center.

People

• Energy Secretary Spencer Abraham visits the Laboratory, cutting a ribbon to officially open the new Terascale Simulation Facility and touring the National Ignition Facility, the world's largest laser installation.

• Hal Graboske, who came close to retiring in 2002 but stayed on as the Laboratory's deputy director for Science and Technology at Director Michael Anatasio's request, retires.

In July, from left, Michael Anastasio and Dona Crawford watch as Secretary Abraham signs the first BlueGene/L rack.

In June, Livemore school board members (from left) Tom McLaughlin and Rebecca Hudson and Livermore School District Superintendent Brenda Miller speak with Director Michael Anastasio during Community Day.

Den Fisher, C.K. Chou and Phil Schultz also retire.

Operations

• The Laboratory's Fire Department marks its golden anniversary of service to the main LLNL site and Site 300, along with nearly as many years of service to the surrounding community.

• A federal public health agency completes a formal Public Health Assessment of the LLNL main site, finding that there are no apparent public health hazards from past or ongoing operations and environmental releases from the LLNL facility.

• The Livermore Lab Employee Services Association (LLESA) celebrates 50 years of employee services at LLNL with a mid-July picnic.

• A Computation Directorate program to recruit underrepresented computer scientists to the Laboratory receives a Department of Energy 2004 EEO/Diversity Best Practices Award.

• The Department of Energy starts the process to compete the management and operating contract for Los Alamos National Laboratory for the first time since LANL's creation in 1943.

August

Science and technology

• In a major step toward the much-touted "hydrogen economy," Livermore researchers successfully test a hybrid hydrogen fuel storage system that could ultimately replace gasoline-powered engines in cars and trucks.

• A Laboratory proposal that screens African Americans at risk for prostate cancer is selected for continued funding from the Office of Congressionally Directed Medical Research Programs.

• A new research technique developed by a team of researchers including LLNL engineer Jeff Florando shows that the mechanical properties of nickel and some of its alloys — such as their ability to resist permanent deformation under stress — are directly affected by the material's dimensions.

• A direct carbon conversion process developed at Livermore shows promise of nearly doubling the amount of electric energy produced from a ton of coal, while largely avoiding the air pollution and climate change problems associated with fossil fuel combustion.

• The U.S. Department of Energy's Joint Genome Institute selects 23 organisms — ranging from an antibiotic-resistant strain of the foodborne pathogen *Staphylococcus* to three species of moss — as the first project in its new Community Sequencing Program.

People

Bill Bookless is named associate director for the Safety & Environmental Protection Directorate, replacing Den Fisher.

• John Wolf, a radiological characterization analyst in the Radioactive and Hazardous Waste Management Division, receives a "Young CHMM of the Year" award from the Academy of Certified Hazardous Materials Managers.

• Senior Staff Engineer Theodore Saito receives an Exceptional Public Service Award from the Department of Defense for his work in nonproliferation policy at the Pentagon from September 2002 to June 2004.

• Bodybuilder John Burmann of the Inertial Confinement Fusion Program at NIF earns a fifth-place award in his inaugural middleweight class bodybuilding competition.

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Quotables

"The next important step will be to transport the canned material off site for disposal or conversion to mixed-oxide fuel."

- Joe Sefcik, Nuclear Materials Technology Program leader, as the Laboratory completes stabilizing and packaging for shipment its surplus plutonium oxide. DNFSB board members toured the SuperBlock to witness the milestone.

"Malicious code attacks and threats are increasing in both sophistication and frequency, as perpetrators display ever increasing cleverness."

– Chief Cyber-Security Officer Mark Graff

"Any ticket they give me into space I am going to take. This is something I've wanted since I was a kid."

– Lab's Jose Hernandez, one of 11 men and women selected by NASA to join the 2004 Astronaut Candidate Class. He will train as a mission specialist and will start with use and training of a new launch vehicle.

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Operations

• Plant Engineering's Weld Shop is treated to a barbecue feast for achieving more than 90,000 safe hours with no lost days as part of Plant Engineering's "Zero Lost Days" safety campaign.

• A dead barn own found on site tests positive for the West Nile Virus.

• The Administrative Information Systems department begins moving more than 50 business applications to a new version of the Oracle 10g Application Server environment, making the applications faster as well as more secure and powerful.

In September, the official unveiling of the Biodefense Knowledge Center: (from left) Wayne Shotts, acting director of the Lab's Homeland Security Organization; Bill Colston, BKC director; Maureen McCarthy, director of the Department of Homeland Security's Office of Research and Development; Charles McQueary, undersecretary of DHS, Mim John, Sandia vice president, and Lab Director Michael Anastasio.

September

Science and technology

• The Biodefense Knowledge Center, established to assist Department of Homeland Security (DHS) officials and the country in the fight against bioterrorism, is dedicated by Charles McQueary, DHS undersecretary for science and technology.

• A cover article in the September issue of *Meteoritics & Planetary Science* features a joint project between the Center for Accelerator Mass Spectrometry (CAMS) and the Institute for Geophysics and Planetary Physics. It is the sixth cover article on CAMS research in scientific journals and magazines over the previous 18 months.

• The Joint Genome Institute publishes the complete sequence and analysis of human chromosome 5 — the largest human chromosome finished to date — in the Sept. 16 issue of the journal *Nature*.

• A team of researchers from the Laboratory and several other institutions publishes a report indicating that untapped reserves of methane, the main component in natural gas, may be found deep in the Earth's crust — providing a potentially inexhaustible source of energy for future generations.

• Two new centers for fundamental and applied science — the Biosecurity and Nanosciences Laboratory and the Center for Biotechnology, Biophysical Sciences and Bioengineering — are formally dedicated.

• By comparing the genome of the plague bacillus, *Yersinia pestis*, with the genome of a close relative, a Laboratory-led team of researchers finds that the inactivation of several hundred genes may be responsible for plague's virulence.

People

• Cherry A. Murray, senior vice president at Bell Labs, Lucent Technologies for Physical Sciences and Wireless Release and a noted physicist, is named deputy director for Science and Technology, replacing Hal Graboske.

• Jane C.S. Long, a hydrogeologist and geotechnical engineer with more than 34 years of national laboratory and academic experience, is named associate director for Energy and Environment.

• Glenn Mara, the Laboratory's deputy director for Operations, announces his retirement after 33 years at LLNL. Wayne Shotts is named acting deputy director for Operations to replace Mara, and Steve Cochran is named acting associate director for Nonproliferation, Arms Control and International Security and acting director of the Homeland Security Organization, to fill in for Shotts.

• Claire Max, a longtime astrophysicist at the Laboratory and a faculty member at UC Santa Cruz, receives DOE's prestigious E.O. Lawrence Award for 2004.

• Two Laboratory research collaborators — Brian Wirth, a former LLNL employee currently on the faculty at UC Berkeley, and Catherine Snelson of the University of Nevada, Las Vegas — receive 2003 Presidential Early Career Awards for Scientists and Engineers and DOE Defense Programs Early Career Scientist and Engineer awards.

• Three Lab employees — Barry Schrader (Archives and Records), Darrin Valentine (Mechanical Engineering/New Technologies Engineering Division), and Ken Rovasio (Chem-Track and Technical Services Group) — are recognized by the Tri-Valley unit of the American Cancer Society for their service to the cancer community.

Operations

• The University of California implements a new voluntary tax-deferred compensation plan called the 457(b) plan, supplementing the existing 403(b) plan.

• The Lab's 30th annual "Helping Others More Effectively," or HOME Campaign is launched with a goal of raising $1.6 million for non-profit agencies.

• A training video prepared by Plant Engineering's Permit Office & Damage Prevention Team receives a "Government Video Star Award."

• Congresswoman Ellen Tauscher officially opens the LLNL-Sandia Delivery Vehicle Inspection Station in the East Avenue corridor between the two labs.

• The Health Services Department achieves re-accreditation by the Accreditation Association for Ambulatory Health Care.

• Laboratory employees from Emergency Response, the National Atmospheric Release Advisory Center and Public Affairs participate in Diligent Warrior 2004, a nuclear-weapon accident-response exercise at Malmstrom Air Force Base, Mont.

• The department launches a new Safeguards and Security Portal on the Lab's intranet.

October

Science and technology

• IBM announces that the BlueGene/L supercomputer, destined for delivery to the Laboratory in November, has surpassed the NEC's Earth Simulator in Japan to become the world's most powerful supercomputer with a performance of 36.01 teraFLOPS (trillion floating operations per second).

• A research collaboration through the Lab's program for Historically Black Colleges and Universities and Minority Institutions is instrumental in earning Fisk University in Nashville, Tenn., a National Science Foundation Center of Excellence for Research in Science and Technology award.

• Two Lab teams receive Science and Technology awards from Director Michael Anastasio. A team led by Jerry Britten developed processing methods and tooling that produced the world's largest multiplayer dielectric reflection grating and the highest laser damage-resistant gratings. A team led by Guilia Galli discovered Bucky-diamonds and unraveled the atomic structure of silicon and germanium nanoparticles.

• A DOE consortium of national labs, including Livermore, signs an agreement with Second Sight Medical Products Inc. to jointly develop an artificial retina.

• In an article in the journal *Nature*, Lab scientists announce they've found a new melt curve of hydrogen, resulting in the possible existence of a new state of matter — a novel superfluid.

• Researchers from the Joint Genome Institute and Lawrence Berkeley publish findings in *Nature* demonstrating that after deleting large swaths of DNA sequence shared by mice and humans, scientists were still able to generate mice that suffered no apparent ills from their genomes being millions of letters lighter.

• The Laboratory's work in homeland security is lauded at the second Bay Area Conference on

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Quotables

"The UC Faculty has now given a clear message to the Regents and to the Department of Energy about our desire to retain the labs within UC."

- George Blumenthal, vice chair of the Academic Senate. University of California faculty members issue their strongest endorsement yet of UC's continued role in managing the Livermore and Los Alamos labs. A statewide electronic survey shows that two-thirds of the participating members of the UC Academic Senate said that the University should bid to retain the two lab management contracts.

"Water is a societal need and a challenging intellectual problem. Our staff is very excited to be working on this."

– LLNL's Robin Newmark, on the Laboratory being tapped in proposed legislation as a regional center to improve water quality and quantity.

OVERVIEW

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Homeland Security.

• An international consortium led by the Joint Genome Institute releases the first complete DNA sequence of the poplar tree, a member of the most ecologically and commercially valuable group of trees in North America.

People

• Director Emeritus Bruce Tarter is awarded DOE's Gold Award, its highest civilian honor.

• John Lindl and Doug Wright of Physics and Advanced Technologies and Allen Christian of the Biology and Biotechnology Research Program are presented with Edward Teller Fellowship Awards.

• Director Michael Anastasio, Executive Officer Ron Cochran and Computation Associate Director Dona Crawford join Rep. Ellen Tauscher at a "Laboratory Women's Forum" at Lawrence Berkeley National Laboratory.

• Jerry Paul is named principal deputy administrator of the National Nuclear Security Administration (NNSA) by Energy Secretary Spencer Abraham.

• UC President Robert Dynes, Olympic athlete Kristin Heaston and Olympic coach Michael Bottom attend the Run for HOME, kicking off the annual campaign for "helping others more effectively."

• Energy Secretary Spencer Abraham resigns.

Operations

• NNSA Administrator Linton Brooks reviews Laboratory security operations.

• The Defense Nuclear Facilities Safety Board establishes an on-site office at LLNL. Michael Merritt is the DNFSB representative.

• Travel Services takes over the foreign travel approval process from the Personnel Security Department as part of an effort to streamline and improve services.

• The Laboratory unveils a revamped and updated Web presence.

• For the first time, the HOME Campaign offers employees the opportunity to donate early via electronic donation.

• Greenville Road closes to through traffic for a construction project to widen the road and replace the Union Pacific railroad bridge.

• NAI holds an award ceremony to recognize the people who accomplished the move of Z Division into Bldg. 140, the International Security Research Facility.

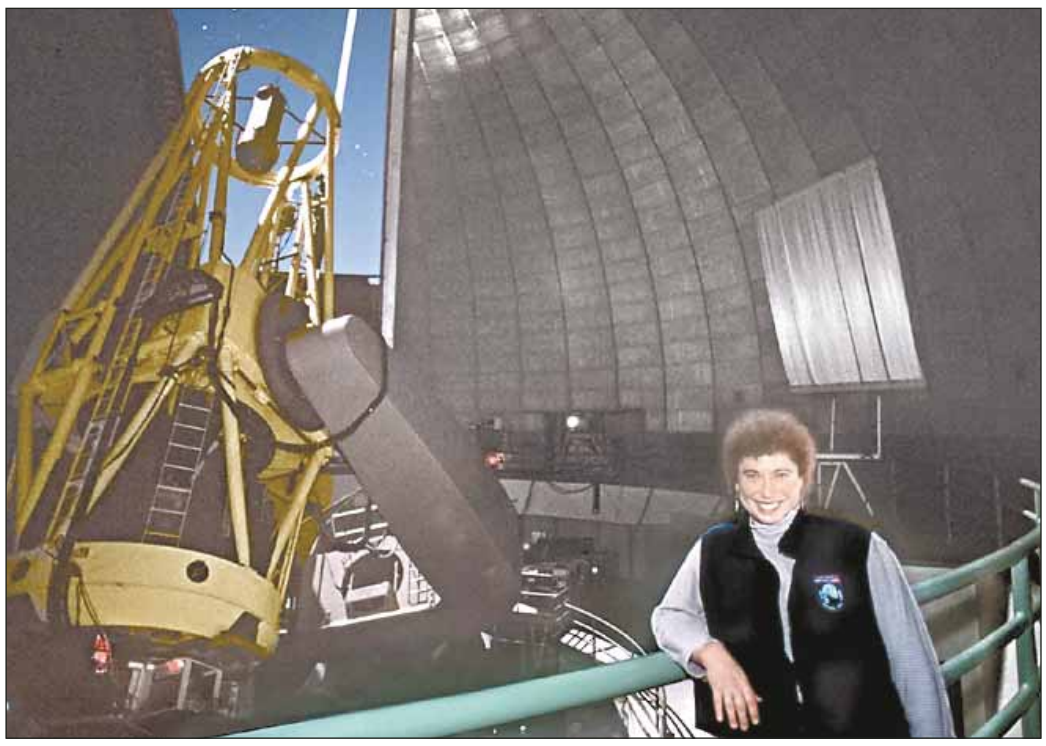
• Health Services announces it will not receive flu vaccine for the 2004-2005 season because of a pharmaceutical manufacturing problem.

• Full services at the South Cafeteria ceases and transitions to "grab and go" food and beverage service anchored by the Java Wave coffee bar.

November

Science and technology

• Energy Secretary Spencer Abraham announces that BlueGene/L, a supercomputer developed for stockpile stewardship, has attained a record-breaking performance of 70.7 teraFLOPS (trillion floating operations per second) on the industry standard LINPACK benchmark. The Top500 list confirms the supercomputer's status with a top ranking announced at the Supercomputing conference in Pittsburgh, Penn.



Claire Max receives the E.O. Lawrence Award for outstanding contributions to physics from Energy Secretary Spencer Abraham in a Washington, DC ceremony.

People

• Claire Max receives the E.O. Lawrence Award for outstanding contributions to physics from Energy Secretary Spencer Abraham in a Washington D.C. ceremony.

• Jim Tripodes, a scientist in the Price-Anderson Amendments Act Office, is named to the state Southwestern Low-Level Radioactive Waste Commission.

• Jerry Lin of the Defense Technologies Engineering Division is named a fellow of the American Society of Mechanical Engineers.

• Cancer expert Eugenia Calle talks at the Lab about the link of obesity to cancer in a presentation entitled "Lifestyle and Cancer: An Overview of Current Knowledge."

Operations

• The National Nuclear Security Administration, the Director's Office and the Defense and Nuclear Technologies Directorate organize and host a two-day "stocktake" with British scientists and national defense experts.

• An "end-of-life-cycle" ceremony for Bldg. 222, the first science building constructed at LLNL, is held and a commemorative plaque unveiled.

December

Science and technology

• The Laboratory officially opens the Microarray Center (LMAC), providing scientists across the Lab with the latest state-of-the-art microarray equipment to analyze DNA, proteins and peptides.

• Studies by Lab researchers published in *Genome Research* offer evidence that "gene deserts" in our DNA may be teeming with life and may play an important role in regulating gene activity.

People

• Cherry Murray, deputy director for Science and Technology, is named winner of the American Physical Society's prestigious George Pake Prize for 2005.

• Director Michael Anastasio and Jim De Yoreo, director of the Lab's BioSecurity and Nanoscience Laboratory, are selected to serve on a task force to promote California as a nanotechnology hub.

• John Knezovich, director of the Center for Accelerator Mass Spectrometry, is named director of the University of California Toxic Substance Research and Teaching Program, headquartered at UC Davis.

• Claire Max, a physicist in the Lab's Institute of Geophysics and Planetary Physics, delivers a Director's Distinguished Lecturer Series presentation on black holes.

• Mike Bradley of NARAC is honored by the Diablo Fire Safe Council with a "Window on the Future Award" for his fire safety efforts with new technology.

• The Lab's Protective Force Division's trainee academy graduates 19 officers.

• Reps. Terry Everett of Alabama and Silvestre Reyes of Texas visit the Laboratory for an overview of stockpile stewardship and national security programs.

• Homeland Security Secretary Tom Ridge resigns.

• Members of five teams that won 2004 R&D 100 awards are honored at a reception and given plaques.

• Samuel Bodman is nominated by President Bush as Energy Secretary.

Operations

• With a strong surge to the finish, the 2004 HOME Campaign set a new record by raising more than $1.6 million for non-profit agencies.

• NIF celebrates its fourth consecutive year

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Quotables

"The Laboratory truly came of age in 1957, when the U.S. Navy decided to entrust design and development of its new Polaris missile warheads to Livermore."

– Director Michael Anastasio

"Because the concept of teaming with industrial partners is a new one, I want to reassure you that the University believes that this will further strengthen our management."

– Robert Dynes, UC President, on the UC Regents approach to competing for the national laboratories management contracts

"This is 21st century technology that will enable engineers to design aircraft parts that are safer, lighter, perform better and are more economical."

– Lloyd Hackel, leader of LLNL's Laser Science and Technology Program, on the concept of laser peening

"Martin would be appalled. We somehow went to sleep. That dream has not yet been realized."

– Willie Brown, referring to the 1954 Supreme Court decision overturning the legal notion of "separate but equal" during a Black History Month speech

SUMMARY

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Science and technology

Early in the year, scientists from the Glenn T. Seaborg and the Chemical Biology and Nuclear Science Division collaborated with researchers at the Joint Institute for Nuclear Research (JINR) in Russia, and discovered the two newest super heavy elements, element 113 and element 115. The discovery earned itself a spot as one of the top 10 science stories for 2004 on the Discovery Channel.

Facilities and science in support of stockpile stewardship made significant progress. The National Ignition Facility (NIF) began the transition to an operational experimental facility with successful testing of the first bundle of lasers. The JASPER gas gun at the Nevada Test Site, operated by Livermore, conducted a battery of successful plutonium shock experiments.

BlueGene/L, a supercomputer supporting stockpile stewardship, became the world's most powerful computer with a performance of 70.72 teraFLOPS (trillion floating operations per second) on the industry-standard LINPACK benchmark. Developed by IBM in collaboration with Lab researchers, Blue Gene/L (BG/L) is the top-ranked computer on the Top500 list. The Lab's "Thunder" Linux cluster is ranked fifth on the list.

Laboratory researchers earned five R&D 100 awards, called the "Oscars of invention."

The multidisciplinary team science that has long been a hallmark of the Laboratory spawned new centers focusing research efforts in science and technology in support of national security.

Two new internal laboratories debuted at the Laboratory in fall 2004. The Center for Biotechnology, Biophysical Sciences and Bioengineering (CBBB) serves as a one-stop shop where academic and private researchers can partner with any number of scientists to work on emerging medical, bioscience and environmental technologies. The BioSecurity and Nanosciences Laboratory (BSNL) serves as an incubator for exploratory science, which is then nurtured in support of the Lab's mission in nonproliferation, counterterrorism and life sciences.

In September, Charles McQueary, undersecretary for the U.S. Department of Homeland Security, was the guest of honor at a ceremony dedicating the Biodefense Knowledge Center (BKC) at the Laboratory. Drawing on the expertise of researchers at four national labs, the national center provides a 24-hour-a-day, seven-day-a-week capability for assistance in combating bioterrorism.

Postdocs surveyed by *The Scientist* rated the Laboratory one of the best places to work. LLNL ranked seventh among the 60 institutions surveyed.

Operations

The University of California's contract to manage the national labs for the Department of Energy and National Nuclear Security Administration continued to be the focus of attention in 2004.

DOE/NNSA extended the University's contract to manage the Laboratory to Sept. 30, 2007, to allow the University to concentrate on the competition for the Los Alamos contract. UC regents have indicated their intent to compete for the contracts to operate and manage Lawrence Livermore, Los Alamos and Lawrence Berkeley national labs, but haven't made a final decision.

Lending support to UC's bid, faculty at the nine UC campuses voted in favor of the University's continued management of the national labs.

Administrative and specialist restructuring was completed, enhancing the pay and performance system by providing more consistency across Lab organizations and creating new job families more closely tied to the outside job market.

The Laboratory's Security organization, previously Safeguards and Security, unveiled new updated roles and a new look as well as a new truck inspection station serving LLNL and Sandia National Laboratory.

NNSA's Facility Improvement and Revitalization Program allowed the Lab to open a new office building — Bldg. 142 — to accommodate the needs of evolving missions. The new Central Café opened its doors in February, enhancing employees' dining options.

The annual campaign for "helping others more effectively," or HOME, celebrated its 30th anniversary with another record year, raising more than $1.6 million for nonprofit agencies and organizations.

Keisha Hadley serves Kinnon Ernst, followed by Joni Schuld, during a celebration marking the opening of full services in the new Central Café in February.

OVERVIEW

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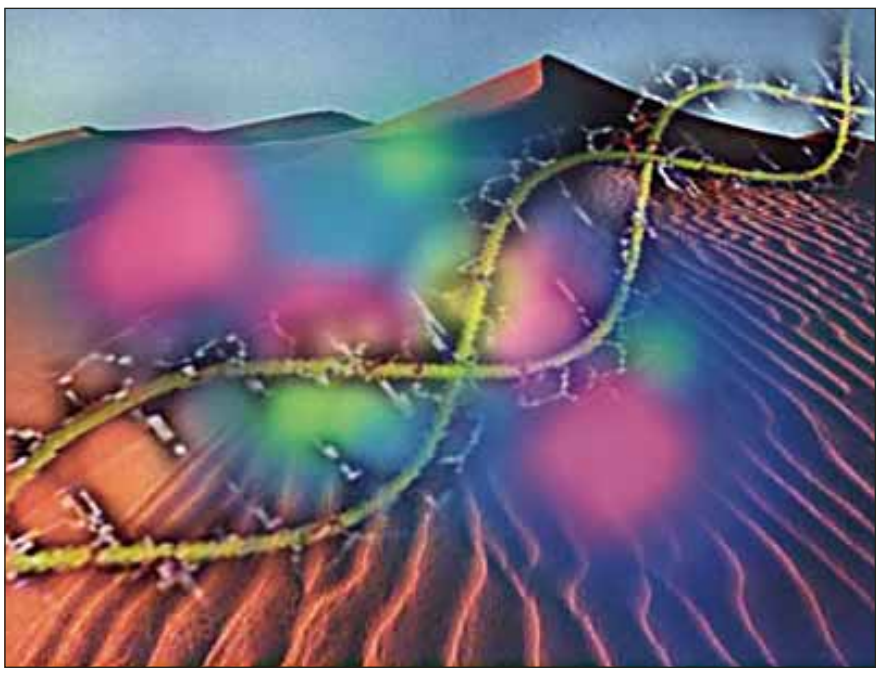
without a lost work day due to an on-the-job injury. As of Nov. 30, NIF personnel had worked more than 4 million consecutive safe hours.

• Motorcyclists from the Laboratory, Sandia and the community ride from the Lab to Site 300 to raise money for the Adopt-a-Platoon program supporting troops deployed in Iraq and Afghanistan.

• The National Nuclear Security Administration seeks comment on a draft "request for proposal" for selection of a management and operating contract for Los Alamos National Laboratory.

• An earthquake on Dec. 26 near the Indonesian island of Sumatra triggers a tsunami that causes great loss of life and damage around the Indian Ocean.



Laboratory scientists are finding signs of life in areas called gene deserts, originally thought to be full of "junk DNA."

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